Baker (H. M.)

Letter from Prof. BAKER

ON THE

CHEMISTRY

OF

BROMO-CHLORALUM,

TO

SURGEON WELLS OF U. S. NAVY.

ALSO, TESTIMONIALS IN REGARD TO ITS

DISINFECTING AND DEODORIZING PROPERTIES

FROM

PHYSICIANS AND SURGEONS.

Letter from Prof. Baker to Surgeon Wells, of U. S. Navy.

WILLIAMSBURGH, N. Y., Dec. 18th, 1871

Dear Sir—The subjects presented in your letter invite extended discussion and if the consideration they merit was accorded to them, it would furnish sufficient matter to form a very voluminous work.

As the action induced in the process of "deodorizing," "disinfecting" &c., varies according to the agent employed, it is impossible to make a general rule applying to all substances possessing such characters, but one may acquire a general knowledge of their mode of operation upon special well known principles.

It is a theory of chemistry that any body of *organic* constitution (especially if one of its elements be nitrogen) is subject to enter into spontaneous decomposition under mild influences, such as a certain range of temperature, the presence of moisture, the action of direct, or diffused light, or contact with another body of like feeble structure.

The reason for such properties is founded upon the fact that, for the most part, the greater the number of chemical elements existing in combination to form a particular body, the more feeble becomes the chemical affinity that compels such combination, and should nitrogen be one of those elements, then the chemical constitution is rendered very much less stable, because nitrogen is very feeble in all its affinities.

Those bodies which emit foul odors are of *organic* structure and it is during the progress of what we call "spontaneous decomposition" that these odoriferous compounds are evolved; so that any substance placed in contact with the decomposing matter, which arrests chemical dissolution, or putrefaction by *displacement*, *substitution*, *elimination*, *direct combination*, *mutual decomposition*, or by *inducing a change of molecular structure*, or *Catalysis*, thereby forming a *new and stable compound*, may justly be styled a "Deodorizer."

The bodies of most frequent occurrence, and that exist in excessive quantities, which exhale offensive odors during decomposition, are the animal and vegetable tissues, as Albumen, Gelatine, Fibrine, Caseine and a vast number of nitrogenous compounds from the blood, bile and excrementitious substances at slaughter-houses and provision stores, and also fœcal and urinary matter in water-closets, urinals, &c., besides the unexamined products of decomposition in cesspools, sinks, offal barrels, casks and the like.

The term "disinfectant" is often employed as though it indicated, or implied Anti-infection, but it seems that its meaning might with propriety be extended to substances which induce the chemical destruction of, or removal from, infected tissues of virulent matter.

Some infections are of local and others of a general character and may be communicated by contact, but many contagions are supposed to be transmitted by the atmosphere to the lungs, where the poisonous matter meets the blood, and thereby finds food which it appropriates to its own growth, against the faithful protest of the vital powers.

The power of virus is chemical in its character; so if the vital forces are in a depressed condition, it is most probable the chemical forces will acquire the mastery, although an active strife exists between the two.

No positive knowledge prevails as to the origin of infecting bodies, nor any proofs of distinct characteristics except in the effects manifested.

The venom of the reptile differs from the virus of rabies and variola, and these three again from the Carcinoma of the cancer.

An "*Anti-infectant*" cannot be indicated through the aid of reason until a sufficient quantity of the isolated contagious matter can be procured for the investigation of its properties; so we must content ourselves with the employment of those agents which experiment and observation proclaim most trustworthy.

A "*Disinfectant*" should possess the property of destroying the chemical structure of virus and thereby produce in its stead, a body with *inert* characters, and consequently afford the natural chemical and vital forces an opportunity to pursue their regular vocation, or function of removing effete matter, and replenishing the exhausted tissues, unobstructed.

To convey an intelligent idea of the mode of changing a chemical structure, recourse must be had to illustration and allusion.

If a bottle of water saturated with Chlorine gas be subjected to the action of sunlight, the water will be decomposed, the hydrogen thereof combining with the chlorine to form hydrochloric acid, while the oxygen is set free.

This same change occurs in diffused, but more slowly than in direct light.

The same change also occurs when a saturated solution of chlorine gas in water is put in contact with other bodies where one of the elements of such bodies has an affinity for oxygen

Now suppose a case of local infection so situated that chlorine water may be applied thereto.

If the infecting virus be a chemical body willing to surrender an equivalent of its hydrogen to the oxygen of the chlorine water, thereby forming water by the combination of said gases, while the chlorine and hydrogen of the chlorine water unite and form hydrochloric acid, then we have produced three new compounds neither of which existed at the outset.

Thus, the virus has parted with one chemical equivalent of its hydrogen, consequently is not the same body as before, and hence has lost the character it previously possessed, while the oxygen has entered into combination with the eliminated hydrogen of the virus, and the chlorine with the hydrogen of the chlorine water, the resulting products being hydrochloric acid, water and transformed virus.

All these newly formed substances are still in contact with the tissues to which the chlorine water was applied, but the question suggests itself, whether these new products are detrimental to the natural processes which should go on in the healthy tissues? If the appropriate agent for the case has been selected, they are not.

Suppose another case of local infection, with the employment of the

same agent, but a difference in chemical structure of the infecting virus. In this case, the virus is unwilling to surrender any of its hydrogen, but has a strong desire for oxygen which the chlorine water yields up to it.

Here the action is different from the former case, and so also are the products, except one, namely, hydrochloric acid.

It may also occur that the product of recomposition from the virus and the newly formed hydrochloric acid may combine at the instant of being formed (in the nascent state), and produce a new body, possessing healing qualities.

From the foregoing, one may observe that the baneful influence of the offensive matter is not only removed, but an agent invested with salubrious properties is brought into contact with the previously injured tissues.

It is the nature of virus to appropriate organic tissues to its own growth, under certain temperatures, and in the presence of moisture, which conditions animal bodies supply, and it operates more rapidly in an abundance of light, but its progress is all the time opposed by the vital forces, and should these forces exceed those of the virus, they will prevail, and "vice versa."

The term "Zymotic" is now applied to "epidemic" maladies, and implies fermentable diseases, hence it is inferred that the action of the virus in contagious affections is very similar to that of yeast in the presence of sugar and nitrogenous bodies, so that any substance which alters the constitution of "infectio purulentia", or interrupts its progress by "catalysis" is a *disinfectant.*

Catalysis may be illustrated, in a comprehensive manner, by what occurs in distilleries, where it is desirable to arrest fermentation in the "fermenting tuns," before it reaches the Lactic and Acetic stages.

If a few drops of tallow from a candle in a melted state, be dropped into fermenting "wort," the fermentation immediately ceases, notwithstanding many thousand gallons are acted upon.

It is therefore apparent that one body by its presence may render another one inert, as well as excite to activity.

A catalytic Disinfectant should therefore be a body of strong chemical constitution, while one that acts by transformation should be of feeble structure, and always ready to make an interchange or exchange of one or more of its elements, or disposed to take from, surrender to, or directly combine with, the obnoxious matter that propagates and subsists at the expense of the animal economy. To more fully explain this view it may be mentioned that Chlorine desires a union with Hydrogen, and when the opportunity is afforded, seizes and holds it with considerable force, and thereby becomes an element in a comparatively permanent compound.

In its combinations with the chloroxides, chlorites and chlorates, its constant desire is to yield up the oxygen which is held feebly, and become a chloride by combination with the metal of the base, under slight disturbing influences. The liberated oxygen combines with or eliminates from the virus, in either case inducing a change of structure, and consequently of character.

Sulphites act differently, as they need oxygen to transform them to sulphates, in which condition they become permanent. So it will be seen that the former agents dehydrogenize, and the latter deoxidize.

Sulphurous acid seeks oxygen to transform it to sulphuric acid, and when it attains this stage of oxidation, its appetite for that element is appeased.

Some sulphates act in the same manner from their propensity to become sulphates of peroxides and persulphates.

Iodine, Iodides, Iodites and Iodates, Bromine, Bromides, Bromites, Bromates, and a large class of organic salts are always ready to acquire a more neutral condition, under the circumstances set forth, so that a powerful agent is necessary to disturb that state of repose when once attained.

Many of these bodies, after their transformation, possess an entirely different set of properties, thus: If sulphurous acid becomes sulphuric in contact with animal tissues, it then acquires stimulant, astringent, and in the stomach, tonic properties, if dilute; but at a certain degree of concentration it becomes an escharotic, and if anhydrous is quite inert in the absence of moisture or water, but should water be present or some inorganic salts, it assumes a catalytic action.

It will therefore be observed, that a complication of effect may arise, from the employment of the same agent in different degrees of concentration.

As nearly all putrescent matter is composed of Carbon, Hydrogen, Oxygen and Nitrogen, and in most instances, Sulphur and Phosphorus, any element invested with a powerful affinity for either one of these, when brought into contact therewith, disorganizes the putrid body and it no longer exists.

The disorganizing element may be very poisonous itself, if in a free state, so it is important to combine it with another body to neutralize such influence; but that other body must retain it, with a force so moderate that it may, at all times, be at liberty to leave and combine with any of the above named elements (forming the constituents of a putrid mass), when brought in contact therewith.

To ascertain that "Bromo Chloralum" exhibited the character of being easily decomposed as just described, it was subjected to analysis, and found to be an aqueous solution of the double Bromide and Chloride of Aluminium with unimportant traces of Iron, Magnesium and Calcium.

The Chlorine and Bromine are chemical elements vested with powerful and wide ranges of affinity, while the Aluminium is of feeble and limited propensities in all its relations, if in aqueous solution.

The Bromine and Chlorine being both volatile and poisonous, in a free state, it is necessary to combine them with some body possessed with only sufficient affinity therefor to detain them and render their transportation, as well as use, safe and convenient, and that will yield them up without reluctance to other elements in putrescent and infected organizations. Such a body is found in Aluminium, or its oxide.

These conclusions were attained by subjecting the Bromo Chloralum to the action of such chemical influences as are well known to exert feeble powers.

The first experiment was made by submitting a portion of the Bromo-Chloralum to distillation in a retort immersed in an oil-bath at a temperature of 265° Fahr.

This comparatively low temperature was sufficient to break up the compound and decompose a portion of the water.

The Hydrogen of the decomposed water united with the Bromine and Chlorine forming Hydrobromic and Hydrochloric Acids which were expelled and passed to the receiver, while the oxygen of said water combined with the Aluminium forming Alumina, and this was left behind in the retort.

Now suppose the Bromine and Chlorine above named, had been combined with Potassium, Sodium, Calcium, Glucinum, Barium, Strontium, &c., and subjected to the same treatment, it would have also been necessary to use either Sulphuric, Nitric, Phosphoric, Arsenic, or Oxalic acids, to expel them.

In the former case, simple application of the temperature produces the effect; in the latter, a displacing agent of strong power is necessary in addition thereto

This experiment, however, sustains no relation to the application of the Bromo-Chloralum in securing salutary effects; so the next experiments were conducted to obtain assurance that its equipoise would be disturbed by more mild and ordinary influences.

Some vegetable fibre immersed in Bromo-Chloralum undiluted, for five minutes, then rinsed in water dried and pressed with a hot iron, was found to have its fibrinous structure entirely destroyed, which was known by subjecting the same to slight attrition in the fingers.

Here the structure of the fibre and the chemical constitution of "Bromo-Chloralum" were changed. Starch, Sugar, woody-fibre and many other organic compounds were transformed in like manner, but it was necessary to examine the resulting products to trace the transformations, a description of which would be irksome in its details.

Other and more delicate tests were made by the employment of vegetable colors, a number of which have their chemical structure entirely destroyed by contact with the "Bromo-Chloralum," which became known by the fact that it was impossible to regenerate the original tint by any process of neutralization, and when neutrality was attained, the tinctorial body became changed to one of new hue, or was colorless.

These tests were so delicate and the transformations so marked that the impression was forced upon us that the "Bromo-Chloralum" must be a mixed Hypobromite and Hypochlorite of Aluminium, but a strict chemical examination did not exhibit these characters.

To establish the effectiveness of Bromo-Chloralum as a *deodorizer* and *disinfectant*, putrefaction was induced in pieces of animal fibrine, gelatine and caseine.

Each was placed under an inverted glass jar, upon plates with sufficient water and exposure to sunlight, and a fermentable temperature, to support and accelerate putrefaction after it was induced.

When it was determined that the process of dissolution was thoroughly established, a quantity of "Bromo-Chloralum" was injected in and upon the decaying, or fermenting mass, and the evolution of offensive gases and fermentation ceased at once, or within five minutes.

Animal fibrine, gelatine, caseine, and a vast number of organic substances, are prone to undergo decomposition from the effect of mild influences, when water is present, but in the absence of that fluid and when quite dry, may be kept for an indefinite period entirely without change.

A favorable illustration of this statement may be observed in gelatine, or glue. It is known to keep for years, so long as moisture or water is excluded, but when mixed with that substance to the consistency of a limpid fluid or concentrated syrup, and exposed to ordinary temperatures, is sure to enter into decomposition before the third day thereafter.

This suggests a convenient mode of preparing a putrescent body, with which to test the relative disinfecting powers of "Bromo Chloralum" or other agents of that class.

In rotten eggs and other animal products, as carrion and the like, where some of the products of decomposition are phosphuretted and sulphuretted hydrogen, phosphohydride, and sulphohydride of ammonium, experiments were made by placing the putrescent masses under the bell glass, tubulated at the top, and supported by wedges on the plate to admit of a free circulation of air. Above the putrefying mass was suspended porous coke which had been previously treated with hot dilute hydrochloric acid, and subsequently washed with hot water, to remove extraneous matter.

This coke was saturated with "Bromo Chloralum," and the escape of offensive gases from the "tubulaire" (tubular opening) ceased altogether after about two minutes, but fermentation was visible below. Bromo-Chloralum to excess of saturation, was then injected upon the coke, so it might drip upon the decaying body, and after about five minutes, the fermentation ceased, notwithstanding the conditions favorable thereto were maintained. Here three effects were manifested; namely, *deodorizing*, *disinfection* and *absorption*.

These experiments were repeated with the substitution of "Pumice Stone" for coke, and with equally favorable results. (Would not Coke or Pumice be available agents for absorption, suspension, distribution and diffusion in Hospitals?)

In all the foregoing experiments, it is more conclusive to work in sunlight, for, as that agent favors decomposition, it also assists disinfection, besides affording a more perfect observation.

In this connection it seems proper to make an observation upon the method of testing "Bromo Chloralum" as an absorbent of sulphohydric and phosphohydric acids, sulphohydride and phosphohydride of ammonium.

The proper way is to expose the Bromo-Chloralum in extended surfaces upon Coke, Pumice or cloths, in such a position, in a comparatively close vessel, as to intercept the sulphur compound in its transit, and not by driving sulphuretted hydrogen through it, because it is injected therein by its own pressure as generated, and passes through in bubbles, or spheres, and being of low specific gravity, its flight through the liquid is so rapid, that the opportunity of contact is prevented, except upon the exterior surface of each bubble, or sphere.

We made this mistake ourselves at the outset, and reasoned that a compound of sulphide of aluminium was formed in the first instance, and this was at once decomposed in the presence of water, and the sulphuretted hydrogen reproduced. A more accurate study of the subject showed that the sulphide of aluminium could not be formed in the presence of the water, and the escape of sulphohydric acid was due to its rapid generation, and want of proper contact with the absorbent.

It is well known to chemists that an aqueous solution of sulphide of aluminium cannot exist, as it decomposes water, and is itself immediately decomposed when placed in that menstrum, the products being alumina, and sulphohydric acids, but a mixture of bromide and chloride of aluminium will decompose a certain percentage of sulphohydric, and phosphohydric acids, and their ammonium compounds.

The effort was made to trace the transformations and to assign a reason therefore, representing the changes by equations.

No satisfactory proofs of the order of transitions were adduced, but the inference that the sulphur and phosphorus compounds induced the forma-

tion of an aluminium chloride of alumina, and set the bromine free, seemed justifiable, because Æther would take up bromine when the compound which had been acted upon was agitated with it, and a small quantity of starch immersed therein was changed to an orange hue.

The bromide and chloride of aluminium used for these experiments were made chemically pure and as a quantity of sulphur was recovered from the sulphuretted hydrogen acted upon, that compound must have been decomposed to produce it.

Bromide of aluminium is capable of dehydrogenizing sulphuretted and phosphuretted hydrogen, with the deposition of sulphur and phosphorus, and will also dehydrogenize ammonia, with liberation of nitrogen. Chloride of aluminium does not seem to exert this power, but manifests a peculiar behavior toward sulphurous and phosphorous acids, and many copulated volatile compounds.

In all these experiments with sulphur and phosphorus compounds, the amount of effectiveness was estimated by the quantity of recovered Phosphorus or Sulphur, either as elementary bodies, or as Phosphoric and Sulphuric acids to which they were converted.

Experiments demonstrated the fact, that "Bromo-Chloralum" is a compound of feeble constitution, consequently is capable of acting by displacement, substitution, mutual decomposition, alteration of molecular structure in, or upon (and in many instances by direct combination with) other substances of like feeble structure.

Hence, I have no hesitation in recommending it as a very efficient agent for arresting putrefaction and as a "deodorizer."

In all cases of "Purulentia", "Bromo-Chloralum", from the nature of its chemical relations, is entitled to an exalted position as a "disinfectant," and as it is also an absorbent, the title of "anti-infectant" should also be accorded to it.

The next consideration of the Bromo-Chloralum is as an antiseptic. This term implies opposition to putrefaction, and as the action of "deodorizing" and "disinfecting" includes the character, it becomes unnecessary to further discuss the relation.

As an "alterative", it is difficult to infer to what extent the "Bromo-Chloralum" possesses such properties, without very extended observation, particularly as the term itself is employed in so many senses; but that application of it which is most generally accepted, implies that an alterative is a body capable of inducing salutary effects, without increased secretion or evacuation. As the action by which such effects are secured is not well understood, it is impossible to predicate for, or appoint to, any body such characters, therefore its reputation as an "alterative" must become established through observation.

The relations of the "Bromo-Chloralum" as an astringent and styptic, were inferred from its behavior upon freshly drawn blood, and upon a solution of albumen from an egg.

It possesses the power of coagulating albumen, and it may also be judged by its effect upon the membranes of the mouth when tasted, inasmuch as it produces nervous irritation and contractibility of that tissue.

Regarded as a "styptic" no objection to the "Bromo Chloralum" can be offered, when the same is employed of full strength for that purpose.

Styptic and astringent are nearly synonomous terms in their general application, but there is this distinction, that an astringent produces contract-

ility of the fibrous tissues by nervous irritation, and the absorption of water, or fats therefrom, while a styptic exerts a similar action, and at the same time coagulates certain compounds contained in the fluids enclosed in the cells of all animal tissues.

The results of my investigation accord both properties to Bromo-Chloralum." HAYDEN M. BAKER, *Chemist, Industrial Laboratory.*

Bromo-Chloralum as a Deodorizer and as a Useful Application in Small Pox.

PEORIA, April 12, 1872.

Gentlemen.—Before I shall enter the fulfillment of a promise I have made to Mr. Pett, a long time ago, regarding my success in using your Bromo-Chloralum during the Epidemic of Variola from January the 12th, to the present day, 1872, I beg leave to acknowledge the receipt of several letters, and of Xylol, which you had the kindness to forward to me.

Gentlemen, whatever I shall have to say in giving you my experience made with about eighty patients down with Small Pox in our community, I beg you to understand, and all whoever afterwards may hear of my opinion regarding this subject, that it is the result of close observation of such as have been treated when on their sick beds, with the disease; or such as had to fill the position of nurses or were members of the family in which I had the opportunity of making my trials.

Appreciating your production, the Bromo-Chloralum, I consider it first as a Deodorizer, and feel bound to say that it has surpassed my most sanguine expectation, and the expectation of all. The quarters of many of whom I found narrow and oppressive, and who were compelled to live with their sick, inhale over and over again their exhalations both from the respiratory organs, general integuments, and dejections.

I do not hesitate to confess that many a place was an abhorence the first time to pay a visit to, but no sooner had the party in charge been taught the use of your Deodorizer, than all smell and stench was gone, the nostrils opened and breathing went on as in open air without nausea; sick and well ones testifying to this fact. In the same way the contents of vessels were made inoffensive to the olfactory nerves of such as were called to dispose of them.

Thus the deodorizing quality of the Bromo-Chloralum being proven to one of the several organs, faith in its disinfecting quality and virtue could not fail to be established, the way of argument being a simple one. For what is able to destroy in the atmosphere we inhale, elements communicating an offensive, unwholesome smell, must have the power to destroy in the same way, other agents adverse to health when contained in the air; and this I judge your Bromo-Chloralum is not only calculated to do, but is, in fact, realizing; each and every one of the articles entering by chemical process into union, being a powerful agent in itself, and an effective means in the hand of a physician against ailments and suffering of the human race of serious character, touching the organism not on its surface only, but in its inmost constitution.

What the medical world, up to the new era of your discovery, had in the line of disinfectants, is now justly antiquated, for who would like to resort to Guyton Morveau fumigations, or even those of Smyth, either of which not only were destructive to contagious agents, but the infected articles at the same time, if particular care and forethought was not taken

for the latter. More creditable and less objectionable was Labarraques chlorine, but unlike yours, it is irritating to the nostrils, like carbolic acid, or carbolate of lime.

I freely confess, for sick rooms, I shall henceforth use no other Disinfectant and Deodorizer than your Bromo Chloralum.

So much for it in this respect. Now some words as regards its value as an application or wash in Small Pox. There is no controversy whatever amongst all *my* patients during our last epidemic in regard to its soothing influence, when applied by means of moistened cloths to the face or any part of the burning and itching surface.

Its influence was such, that after the first application had been made, they would be easy, and fall asleep, after nights of discomfort, asking when awake forthwith for renewal of the application. Besides this soothing influence, the eruption came hardly to suppuration; the pustules, at an early period, commenced to exsiccate and the scabs came off in the shortest period imaginable, and what in almost every case I am able to exhibit, is—no pitting is traceable in any of the faces having been thus protected against the combined influences of light and air. My honored colleagues, Doctors Robert Roskaten and George Lucas, who on my recommendation have made experiments with cases in their charge, testifying to the same effect.

I have even used it as a prophylactic for my own person, and advised my friends to follow my example, by taking from 10 to 15 drops, four times a day, diluted with sweetened water and brandy, a tablespoonful each. But its charming influence did not end with its application to the face or as a means of bathing the external surface where it was applied in proportion of 1 to 10 parts. I directed its use also as a wash both for the nostrils and fauces, wherever by copious eruption the passages had become impaired. In every case its application has been successful, in these cases its strength (original) was reduced by 15 or 20 parts of water added.

Having thus far given you my observations concerning the results of Bromo-Chloralum in cases of Small Pox, under my care, I feel bound to add some words in regard to Xylol as a means of treating this disease with decided success I am indebted for its knowledge to a *Daily* in which its use was reported in the clinic of the Charity Hospital in the City of Berlin, where Doctor and Professor Wm. Zuilger during the last Epidemic there achieved the best results. In imitation of him, I exhibited it in doses of 10 to 15 drops for adults, and 3 to 5 drops for children, every 2 or 3 hours, as need might be, and covered its taste in an emulsion made of Pulverized Salep, one scruple to a four or six ounce mixture, made pleasant for the palate by adding flavor and suitable syrup.

In my judgment all cases from the time I had received it by the kindness of Messrs. Tilden & Co., were just half as short in their duration as before I was in possession thereof. Of course I should not forget to mention that during the earlier stages of the disease, the bowels were a particular object of attention, the inactivity of which was prompted by Electuarium of Senna, whilst at a later period when the scales had come off, gentle diuretic and diaphoretic means were resorted to.

With the assistance of these means the mortality ratio of 16 to 110 or 115, as were under treatment all over the wards infected, is a very favorable one, and I consider it to a great extent due to the agents obtained from Messrs. Tilden & Co., to whom I hereby express my heartfelt thanks.

DR. J. N. NIGLAS. *Health Officer.*

Bromo-Chloralum as a Disinfectant in Typhoid Fever, and other Contagious Diseases; also, as a General Deodorizer and Disinfectant.

PEEKSKILL, August 10th, 1871.

GENTLEMEN—The package of *Bromo Chloralum* which you favored me with some time ago, has been carefully used by myself, and some of my medical friends, with the following results:

1. *As a certain, perfect* and *prompt deodorizer*, it is far superior to any article of the kind we have ever employed, not excepting carbolic acid. The most noisome and disagreeable odors are instantly destroyed by its application; while itself leaves no unpleasant smell behind. I find that a solution, made by adding one part to 20 of water, placed in sinks, water-closets, sewers, cesspools, &c., immediately removes all unpleasant smell.

2. *As a disinfectant* I have used it successfully in *typhoid fever* and other infectious diseases. I have no doubt it is destined to take the precedence of chloride of lime, zinc, soda, carbolic acid, the poisonous mineral salts, and all other agents hitherto introduced for this purpose. The experience of my medical friends, also, coincides with my own on this point. One great advantage it possesses over all other agents I have ever used is, that its inhalation causes no feeling of irritation in the air-passages and lungs. It is not only safe and non-poisonous, but absolutely free from all disagreeable effects whatever.

3. *As a general deodorizer and disinfectant* for all manufactories where decomposing animal or vegetable materials are used, it must prove invaluable—also as a *Sanitary agent* for Boards of Health, in our large towns and cities, who will, I believe, find it both more efficient as well as more economical, than most other articles hitherto employed.

4. *For Hospital Use*, also, I think it must prove very useful for various purposes; among others as a wash for offensive sores and ulcers, sloughing gangrene, cancers, and offensive discharges of all kinds; also for disinfecting clothes and bed-clothing, bedding, and for general deodorant and disinfecting purposes.

5. Regarding then the BROMO-CHLORALUM as altogether the most valuable article of the kind hitherto introduced into practical medicine and hygiene, I most cheerfully and confidently recommend its use to the profession and the public.

CHAS. A. LEE, M. D.,
Professor of Hygiene and Materia Medica.

Bromo-Chloralum in Asiatic Cholera, Yellow Fever, and other Contagious Diseases.

The following is taken from a work on *Asiatic Cholera*, written by Dr. L. P. Brockett:

"In Cholera, yellow fever, and other contagious diseases, the use of "Bromo-Chloralum" in all the vessels before they are required, the application of cloths dipped in a diluted preparation of it, around the bed and suspended in the room, will effectually remove the possibility of contagion. The floors, walls, carpets and furniture may be sprinkled with it freely, without injury; and all the privies, vaults, kitchens and pantries, should be fully disinfected by it. In tenement houses, meat and fish markets, vegetable markets and green groceries, and in the neglected streets of our great cities, it will be found invaluable. With a good supply of it on hand, and thoroughly distributed, most of our towns in the Mississippi valley, may successfully combat the inroads of either CHOLERA OR YEL-

LOW FEVER. These statements are not mere theories based on the abstract knowledge of the disinfecting power of Bromine and Chlorine, but the results of its subjection to the severest tests by men whose authority in all these matters is indisputable. On any question of Hygiene, no name in this country stands higher than that of Dr. Charles A. Lee, a professor, and an author of several able works, on the subject of Hygiene and Materia Medica, and after subjecting it to the most rigid tests in a variety of ways, Dr. Lee says, 'Regarding the "Bromo-Chloralum" as altogether the most valuable article of the kind hitherto introduced into practical medicine and hygiene, I most cheerfully and confidently recommend its use to the profession and the public.' Our own observation of its effects, leads us to endorse the Doctor's opinion most heartily."

MISCELLANEOUS TESTIMONIALS.

Bromo-Chloralum as a Disinfectant in Public Buildings.

POST OFFICE DEPARTMENT, WASHINGTON, D. C., Oct. 17, 1871.

GENTLEMEN.—An experiment with your new Disinfectant, Bromo-Chloralum, was made yesterday, and more than confirmed my previous impression of the great value of this article for general use in large Public Buildings.

We took *three* pints of the Bromo Chloralum, adding *three* gallons of water, this dilution was applied in one of the rooms of this Building, having five urinals, and the same number of water-closets. The odor from this room was such as to be noticeable outside in the hall, and inside, was always very disagreeable in spite of all proper means of ventilation, etc.

I witnessed the first application of the disinfectant, and with others present, expressed my surprise at the almost magical results obtained in less than five minutes, and within thirty minutes, on going out and coming back, could not detect any of the foul odor, and the atmosphere was pronounced as sweet and pure as the office rooms.

I cheerfully recommend the use of this article to officers of Public Buildings generally. AUG'S JORDAN, *Chief Engineer, P. O. Building.*

Bromo-Chloralum as an Efficient and Pleasant Disinfectant and Deodorizing Agent in Residences and Hotels.

CHICAGO, Nov. 24, 1871.

GENTS.—I take pleasure in commending, after frequent observations of its effects, your preparation of "Bromo Chloralum" as an exceedingly efficient and pleasant disinfectant and deodorizing agent.

It is entirely devoid of odor or of irritant effects, so that it can be freely used in residences, hotels, etc., at the same time it is very useful as a local application in many cases of wounds, etc, when, from causes readily appreciated by physicians, the solution of Carbolic Acid proves injurious.

I remain with high respect, yours, etc., J. ADAMS ALLEN, M. D.
Editor and Proprietor of Chicago Medical Journal.

Bromo-Chloralum Recommended by the Board of Health, for Purifying Offensive, Poisonous or Noxious Odors and Gases.

By COMMISSIONER AIKENHEAD: Rochester, N. Y., Sept. 30, 1871.

Resolved, That having tested and tried the Bromo-Chloralum, non-poisonous disinfectant, and this Board being satisfied of its utility as a disinfecting agent, do hereby recommend the health inspectors to use, and

recommend the same to those having occasion to purify any offensive, poisonous or noxious odors and gases, in and about any dwellings, barns, stables, drains, kitchens, cellars, water closets, &c. The foregoing is a true copy from the minutes. [SEAL] WM. F. MORRISON, *City Clerk.*

Bromo-Chloralum as a Disinfectant in the Dissecting Rooms.

MOBILE, Ala., Feb. 18, 1872.

This is to certify that the "Bromo-Chloralum" is of the most valuable aid in our dissecting rooms, as a "Disinfectant."

All our students who have used it, were highly delighted with the same; for if applied to their hands *diluted*, it cleansed them perfectly.

JOSEPH H. SCOTT, *Janitor, Ala. Medical College.*

Bromo-Chloralum Endorsed and Recommended as an Efficient and Reliable Disinfectant and Deodorizer in the Dissecting Rooms and Hospital.

CHICAGO, February 26, 1872.

GENTLEMEN.—We take pleasure in forwarding to you the following extract from the minutes of the meeting of the CHICAGO ACADEMY OF MEDICINE, held February 19th, 1872.

"The committee appointed to test the samples of "Bromo-Chloralum," (kindly furnished by your agent, Mr. A. M Pett,) reported that they had tried the article in dissecting room, and also in the hospital, with gratifying success, and offered the following, which was adopted:

"Resolved, That the CHICAGO ACADEMY OF MEDICINE endorse the Bromo-Chloralum, and recommend it as an efficient and reliable disinfectant and deodorizer." W. DANFORTH, M. D., *President.*

E. A BALLARD, M. D., *Treasurer.*

Bromo-Chloralum as a Disinfectant and Deodorizer in the Public School Rooms.

BALTIMORE, June 5, 1872.

GENTLEMEN.—I take pleasure in certifying to the great value of Bromo-Chloralum as a Deodorizer and Disinfectant. I have used it in the Public School Rooms of our city, and in sick rooms where the patient was suffering from Small Pox, with very gratifying results. ALL offensive odors are removed by its use. As a styptic, I prefer it to persulphate of iron. Its decided superiority over all other Disinfectants consists in the certainty of its action, and from its being inodorous and non-poisonous.

I am, Gentlemen, very respectfully, your obedient servant,

A. W. DODGE, M. D., *Commissioner of Public Schools.*

Bromo-Chloralum as a Disinfectant of the City Dumps.

HEALTH OFFICE, BALTIMORE, May 24, 1872.

GENTS.—We gave the Superintendent of one of the City Dumps, a pint bottle of the BROMO, and instructed him to use it on a night cart that had been in immediateuse, and to select one that was most offensive; he did so, and asserted that after the application of the Bromo, he could insert his head into the trap of the cart without any inconvenience or discomfort as far as his olfactories were concerned. Yours with regard,

GEO. W. BENSON, M. D., *Commissioner of Health.*

Bromo-Chloralum an Acknowledged Success in Deodorizing the Market and Destroying Fœtid Odors.

FULTON FISH MARKET, NEW YORK, July 17, 1871.

GENTLEMEN:—We take pleasure in acknowledging the success of your experiment, yesterday, in deodorizing this market by the use of your "Bromo-Chloralum." The small quantity of the article employed, was largely diluted, and yet in a few minutes, after sprinkling the floors, all fœtid odors were destroyed.

At three o'clock this morning an officer of the company was here to test the condition at the opening of the market, and *found the premises free from all bad smells, a condition never before presented during the warm season.* Yours, respectfully,

W. P CLARK, }
A. C. ROGERS. } *Executive Committee.*

For Fulton Fish Mongers Association.

Bromo-Chloralum in Chronic Ulcers, Congestive Gleet, Gonorrhœa,

The interest manifested in reference to this agent evinces that it possesses a high place among remedial agents and is recognized as one of the most important of our recent additions to the healing art. Notwithstanding the opposition it has encountered it has been tested by very many of our best and most conscientious physicians with very general satisfaction. As an injection in uterine diseases in which there existed offensive discharge, it has very often contributed a blessing in overcoming the odor and rendered loathsome and incurable diseases more endurable. In vaginal leucorrhœa, the result has been far better than anything else that I am acquainted with. I could easily cite a dozen cases which had defied the lead, iron, zinc and vegetable astringents, become obedient to the persuasive influence of the Bromo-Chloralum. As an injection in gonorrhœa, both in the male and female, I have found it superior to all injections, in fact in my hand it has superseded them. It can ever be used with freedom without the slightest degree of stricture. Recently I used it in a case of congestive gleet, with perfect relief after the disease had defied external and internal medicines. As a lotion to obstinate chronic ulcers, it not only dissipates the disagreeable emanations, but excites healthy action and often induces granulation. As a disinfectant it is par excellence, without replacing the impure air with irritating and offensive emanations, it overcomes the noxious and perhaps poisonous effluvia, and leaves the atmosphere pure and wholesome. I find that when used in infectious diseases it modifies, when it fails to destroy entirely, the virus. In the treatment of Scarlatina this is very strongly evident. Every case contracted in an atmosphere subjected to the Bromo-Chloralum has been mild and not a single case has proved unfortunate.

While it is to be regretted that the formula has never been published, we can scarcely refuse so valuable an agent on ethical grounds. Whatever be its constituents it does not alter the least its therapeutical worth or in the least diminish it in the esteem of those who have tried it and realized its great antiseptic properties. CHAS. G. POLK, M. D.

Bromo-Chloralum in Chronic Diarrhœa and Ulceration of the Bowels by Enemas.

Having had a very severe case of Chronic Diarrhœa, and Ulceration of the Bowels, under my care for several months, and not being able with all

the usual remedies to afford only temporary relief, I resorted to injections of Bromo Chloralum ʒ i, warm water o j, immediate relief followed the first application; the patient had had ten or eleven passages during the night, and was very much reduced; but after using the above, there were no passages until the following morning, only three injections were given, and those two and three days apart: and three weeks from the first, the patient reports a perfect recovery. This was the only treatment used.

M. V. B. SAUNDER, Jackson Mich.

Bromo-Chloralum in the Sore Throat of Scarlet Fever.

GENTLEMEN—I wish to call your attention to the prompt action of your Bromo-Chloralum in the sore throat of Scarlet Fever. Not long since I was called upon to treat 5 cases of Scarlatina Anginosa, all in one family; the throats were all very bad from the beginning more particularly so in the case of the oldest patient, aged 17, which bordered on Scarlatina Maligna. In this particular case, there was so much putridity of the throat and tonsils that I prescribed a gargle of Bromo-Chloralum diluted. I prescribed this more from its known powers as a disinfectant than anything else, but upon visiting my patients next day I was so surprised to see the improvement in the appearance that I prescribed a weaker dilution for all the other cases, and the rapidity with which they all got well was truly astonishing. I think if Physicians will give this a trial they will find it "just the thing," in all cases of sore throat of Scarlet Fever. E. A. HULL, M. D., Berlin, Rensselaer Co., New York.

Bromo-Chloralum in Malarial Fever, Cancer of the Face, &c

Since my attention was called by you to the new disinfectant, Bromo Chloralum, I have used it considerably, and with the most satisfactory results.

During an epidemic of malarial fever in September last. I am quite certain that I saw its effects in counteracting the influence of malarial poison, in several instances, also in removing to a great extent the peculiar fever odor which accompanies such diseases.

I have also used it in one case of cancer of the face, where its disinfecting properties were most gratefully acknowledged.

I have put it to a new use which I had not previously seen recommended, but which struck me as being rational, that is its therapeutical powers in the last stage of gonorrhœa, forming an injection of this kind;

Bromo Chloralum, - - - -	1-2 ounce.
Glycerine, - - - - - -	1 ounce.
Aquæ, - - - - - -	3 ounces.

It is used without pain, therefore is perfectly harmless as regards producing stricture, and it seems to cleanse the mucuous membrane, and assist the parts to heal faster than any thing I have ever tried. I can therefore say that so far as I have experimented, as a disinfectant it has no equal, and am also led to believe that it has undiscovered properties which will give it rank among our most valuable articles of Materia Medica.

D. A. STEWART, M. D., Winona, Minn.

Bromo-Chloralum as a Gargle for Diphtheria and Scarlet Fever.

Your preparation of Bromo-Chloralum has been used freely in my practice for the last six months. It is to be commended in almost unqualified

terms,—whether as a styptic, astringent, antiseptic, disinfectant, alterative or deodorizer, it has been successful in accomplishing the purposes for which it has been used; as a gargle in diphtheria, or scarlatina, as a nasal douche in catarrh, for inhalation in chronic bronchitis, for injections in leucorrhœa and gonorrhœa. For all sanitary purposes, whether in private families or for hygienic public uses, it is unsurpassed in efficiency. The great advantage it has over other preparations designed for the same purpose is, that while its efficacy is *greater*, the objections to it are *less*, on account of its unirritating, non corrosive, and odorless qualities.

W. W. D. RICHARDSON, M. D., Winona, Minn.

Bromo-Chloralum in Scarlet Fever and Diphtheria.

The prevalence of SCARLET FEVER, and DIPHTHERIA, as an epidemic in many sections, induces us to call attention to the use of BROMO CHLORALUM as an agent for purifying the air of the *Dwellings* and *Sick Rooms*, by neutralizing and destroying at once all noxious odors and gases, as well as *germs of disease*. and *septic* (putrescent) *particles* floating imperceptibly in the air.

It is a concentrated solution of Aluminium Chloride and Bromide, *inodorous* and *non-poisonous* and after repeated trials, has been found to be both agreeable and potent. It promptly absorbs and decomposes all ammoniacal and noxious gases, and renders the atmosphere and surrounding objects sweet and wholesome. It has been tested in such a variety of cases with such uniform success, that we feel warranted in recommending it to the public for general use, in all places or circumstances that give rise to unhealthy, bad odors.

A Striking Merit of Bromo-Chloralum is, that it operates by removal and not by creating an odor greater than the one sought to be removed. Can be applied in the most simple manner, diluting it according to the *object* or *locality* to be purified. Indeed one great element of its success is the capability of *free diffusion*, causing it to purify the air as well as the walls, ceilings and floors.

For Scarlet Fever and other Contagious diseases suspend towels in the room moistened with it diluted. Use freely on all bedding and in the chamber utensils, previous to use, as by this method the poison of excretion is neutralized.

Also when the throat is ulcerated or inflamed, gargle with it diluted one to ten of water. We are advised that patients feel much comfort from the use of a dilution of one part to twelve or sixteen of water as a wash; all speak of its soothing influence when applied to the burning, itching surface. It neutralizes the poison, limits the spread of the disease. Attendants should use the same freely upon their clothes and person.

For Diphtheria, Sore Throat, &c., dilute one part to ten of water, or stronger according to circumstances, and gargle the throat when advisable, also swallow 5 to 10 drops in a teaspoonful of water. The general directions as to purifying the air of the house and room should be observed fully. TILDEN & CO., CHEMISTS, 176 William St. N. Y.